Northwest Africa 2998

Anorthositic breccia

163 g

Figure 1: Northwest Africa (NWA) 2998 with a cut face exposing the interior, as well as illustrating the flow lines on the fusion crust.

Introduction

Northwest Africa (NWA) 2998 was found in the southern Algerian desert in May 2006, and purchased in Morocco, June 2006 (Fig. 1). It is medium brown in color, and the nearly complete stone has fresh fusion crust with very prominent flow lines (Fig. 1). Its interior reveals a multitude of light grey and white feldspathic clasts in a dark fine grained matrix (Fig. 2; Connolly et al., 2007; Korotev and Zeigler, 2007).

Figure 2: Small pieces of NWA 2998 illustrating the feldspathic nature of the sample. Scale bar at bottom has 1 mm divisions (photo from R. Korotev).

Petrography, mineralogy, and chemistry

This feldspathic or anorthositic breccia contains examples of breccia-in-breccia structure, and granulated or cataclastized breccia clasts with fine-grained to melt matrix. Vesiculated shock-melt veins and isolated glass clumps are also common. One section of this sample contains partially maskelynitized plagioclase fragments (47 vol%), shock-melt anorthositic clasts (38 vol%), dark glasses (7 vol%), norites and troctolites (6 vol%), and olivine and pyroxene fragments (2 vol%). No mare components were observed, consistent with its low FeO contents (Korotev and Zeigler, 2007). Plagioclase composition is variable from $An_{93.6}$ to An_{99}; olivine from ($Fa_{21.7}$ to $Fa_{34.6}$;), orthopyroxene from $Fs_{22.5}$ to $Fs_{29.5}W$, and pigeonite pigeonite of $Fs_{49.3}Wo_{5.2}$; FeO/MnO = 53.

Preliminary characterization of the bulk composition (INAA of 224 mg sample) reveals FeO = 2.7 wt%; Ni =60, Sm = 0.42, and Th = 0.13 (all ppm; Korotev and Zeigler, 2007).

Radiogenic age dating

None yet reported.

Cosmogenic isotopes and exposure ages

None yet reported.